

REMARKS

The Examiner's indication that all of the items listed on Form PTO-1449 of the Information Disclosure Statement of December 12, 2001 have been considered is acknowledged and much appreciated.

The specification has been amended on pages 2, 6, 13, 20, 29, 31 and 37 to address various clerical, typographical, spelling, grammatical, or punctuation errors or oversights. Additionally, the specification has been amended on page 6 to indicate that 2,4-pentadione dioxime may also be referred to as 2,4-pentanedione dioxime, as further remarked upon below. Further, the specification has been amended on page 8 to indicate that the composition may comprise sufficient acid such that the pH of the composition is in a range from approximately 2.0 to approximately 5.0, as set forth in original Claim 13. No new matter has been added by virtue of these amendments to the specification.

Claims 1-23 have been cancelled and new Claims 24-41 have been added. No new matter has been added to the specification by virtue of the new claims. A table showing the general relationship between the former claims and the new claims, where applicable, is set forth below.

<u>Former Claim</u>	<u>New Claim(s)</u>
1	24
2	30
3	33
4	34
5	35
6	31
7	32 and 41
8	36
9	37
10	40
11	25 and 26
12	28
13	41
22	38
23	39

New Claim 24, from which new Claims 25-40 variously depend, and new Claim 41 recite a composition comprising hydroxylamine in an amount sufficient for chemical etching, a material selected from a group consisting of hydroxylamine nitrate, hydroxylamine sulfate,

an ammonium salt, and any combination, the ammonium salt selected from a group consisting of a nitrate salt, a sulfate salt, a phosphate salt, a chloride salt, and any combination thereof. New Claim 41 additionally recites such a composition comprising 4-hydrazine benzoic acid.

Former Claims 4, 16, 22 and 23 were objected to based on alleged formalities. Claims 4 and 16 were objected to based on an alleged misspelling of "2,4-pentadione." It is submitted that 2,4-pentadione is another name for 2,4-pentanedione. New Claim 34 recites 2,4-pentanedione dioxime. Claim 34 has not been narrowed by virtue of this recitation, and no new matter has been added by virtue of this recitation. As remarked above, the specification has been amended to refer to 2,4-pentanedione dioxime. Former Claims 22 and 23 were objected to as being dependent on a claim that did not exist. As these claims are cancelled, these objections are now moot.

Former Claims 1-5 and 8-10 were rejected under 35 U.S.C. Section 102(b), as allegedly being anticipated by an International Application of Small *et al.* Published under the Patent Cooperation Treaty, bearing International Publication No. WO 98/04646 (hereinafter, "Small I").

It is submitted that new Claims 24, 29, 30, and 33-40 are novel, and non-obvious, in view of Small I. As mentioned above, Claim 24 and Claims 29, 30, and 33-40 depending variously therefrom recite a composition for chemical mechanical planarization comprising hydroxylamine in an amount sufficient for chemical etching and a material selected from a group consisting of hydroxylamine nitrate, hydroxylamine sulfate, an ammonium salt, and any combination thereof, the ammonium salt selected from a group consisting of a nitrate salt, a sulfate salt, a phosphate salt, a chloride salt, and any combination thereof.

The Examiner, referring to the Abstract of Small I, alleges that Small I teaches a composition for chemical mechanical polishing that "includes a slurry ... a hydroxylamine, ammonium persulfate" It is respectfully submitted that the Examiner has misread the Abstract of Small I. Small I teaches a composition for chemical mechanical polishing that includes a slurry. (Abstract, line 1.) Small I also teaches that a composition for chemical mechanical polishing is improved by including an effective amount for chemical mechanical polishing of a hydroxylamine compound, ammonium persulfate, a compound which is an indirect source of hydrogen peroxide, a peracetic acid or periodic acid. (Abstract, lines 4-6.) That is, Small teaches five distinct alternatives for improving a composition. Small thus fails

to teach or suggest a composition for chemical mechanical planarization that comprises hydroxylamine in an amount sufficient for chemical etching and a material selected from a group (see recitation above), as recited in Claims 24, 29, 30, and 33-40.

The Examiner, referring to page 31, lines 9-18 (Example 19) of Small I, alleges that Small I teaches a solution composed of hydroxylamine nitrate in DI water, and that the pH was adjusted with small quantities of hydroxylamine, as the free base, and that also used was an ammonium hydroxide solution. It is respectfully submitted that this allegation regarding Small I is in error. In the text of Example 19 of Small I, there is an explicit reference to "this series of tests." (Page 31, line 9.) In the first test, a solution of hydroxylamine nitrate in DI water is adjusted to a pH of 3 and tested; in a second test, a solution of hydroxylamine nitrate in DI water is adjusted to a pH of 4 and tested; in a third test, a solution of hydroxylamine nitrate in DI water is adjusted to a pH of 5 and tested; in a fourth test, a solution of a commercially available hydroxylamine free base in DI water at a pH of 11.7 is tested; in a fifth test, a solution of ammonium hydroxide in DI water at a pH of 12.7 is tested; and the results of these tests are set forth in a table. (Page 31, lines 9-29.) This reading of Example 19 is consistent with the description of recent experiments (plural) on page 12, lines 3-14, in which five distinct experiments involving three distinct hydroxylamine nitrate solutions (at pH 3, 4, and 5, respectively), one distinct hydroxylamine free base solution, and one distinct ammonium hydroxide solution, respectively, are described.

Small fails to teach or suggest a composition for chemical mechanical planarization that comprises hydroxylamine in an amount sufficient for chemical etching and a material selected from a group (see recitation above), as recited in Claims 24, 29, 30, and 33-40. In view of the foregoing, it is believed that Claims 24, 29, 30, and 33-40 are patentable over Smith I.

Former Claim 6 was rejected under 35 U.S.C. Section 103(a), as allegedly being unpatentable over Small I as applied to former Claim 1 above, and further in view of United States Patent No. 5,981,454 of Small (hereinafter, "Small II").

The Examiner relied on column 2, lines 37-45 of Small II for its alleged teaching of a composition for chemical mechanical polishing that contains a buffering amount of hydrazine or hydrazine salt base, in alleged combination with Small I as applied to former Claim 1. It is submitted that Claim 31, which recites the composition of Claim 30 (see above), wherein the

free radical inhibitor is selected from a group consisting of hydrazine, hydrazine derivatives, hydrazine salts, hydrazid, hydrazid derivatives, and any combination thereof, in an amount sufficient to inhibit the formation of free radicals in the composition, is patentable in view of the alleged combination of Small I and Small II.

The remarks above concerning Small I are incorporated herein by reference. Small II fails to make up for the deficiencies of Small I (see remarks above) as to Claim 24, and Claim 30, from which Claim 31 depends. Thus, any hypothetical combination of Small I and Small II, *arguendo*, is insufficient as applied to Claim 31. Further, even if the combination of Small I and Small II were possible, *arguendo*, Small II teaches hydrazine or hydrazine salts for use in buffering a composition. Small II, either alone or in the hypothetical combination, provides no teaching or suggestion of a composition comprising a free radical inhibitor, or a free radical inhibitor selected from a group consisting of hydrazine, hydrazine derivatives, hydrazine salts, hydrazid, hydrazid derivatives, and any combination thereof, in an amount sufficient to inhibit the formation of free radicals in the composition, as recited in Claim 31. In view of the foregoing, it is believed that Claim 31 is patentable in view of the alleged combination of Small I and Small II.

Former Claims 11-17, 20 and 21 were rejected under 35 U.S.C. Section 103(a), as allegedly being unpatentable over Small I in view of United States Patent No. 5,439,551 of Meikle *et al.* (hereinafter, "Meikle").

It is submitted that Claims 25-28 and 40 are patentable in view of the alleged combination of Small I and Meikle. The remarks above concerning Small I are incorporated herein by reference. Meikle fails to make up for the deficiencies of Small I (see remarks above) as to Claim 24, from which Claims 25-28 and 40 variously depend.

As to Meikle, the Examiner relied on column 3, lines 5-8 of Meikle for teaching example chemical-mechanical polishing process parameters that "include pressure of the wafer against the pad, slurry composition, slurry temperature, slurry flow rate, rotational speed of both the pad and the wafer, *etc.*" (Emphasis added.) The Examiner alleges that such provides evidence that the concentration of the polishing composition is a so-called result effective variable. Applicants disagree. Meikle's statement in column 3, lines 5-8, lists a number of alleged example chemical-mechanical polishing process parameters. This lists includes "slurry composition," but it does not mention "the concentration of the polishing

composition.” It could refer to the type of slurry composition or the abrasive character of the slurry composition or something else about the slurry composition.

Further, Meikle’s statement in column 3, lines 5-8, is followed by the statement set forth below.

In the course of detecting a change in the sound waves emanating from the process, multiple of these chemical-mechanical process operational parameters might be desirably changed.

Meikle, column 3, lines 9-12.

Meikle fails to teach or suggest to one of ordinary skill in the art which multiple of these parameters, which includes “etc.” parameters, and encompasses innumerable and unknowable possibilities, might be desirably changed, or how. Contrary to the suggestion of the Examiner, this is not at all a matter of optimization as contemplated in *In re Boesch*. See *In re Boesch*, 205 USPQ 215, at 219 (CCPA 1980). Further, Meikle only teaches such a possible change in multiple operational parameters in the course of detecting a change in the sound waves emanating from the process.

As remarked above, Small I fails to teach the composition of Claim 24, from which Claims 25-28 and 40 variously depend. Even if it were possible to combine Smith I with Meikle’s teaching of possibly changing multiple operational parameters in the course of detecting a change in the sound waves emanating from a chemical-mechanical process, *arguendo*, Meikle fails to make up for the deficiencies of Smith I and fails to teach or suggest the subject matter of Claims 25-28 and 40.

In view of the foregoing, it is believed that Claims 25-28 and 40 are patentable in view of the alleged combination of Small I and Meikle.

Former Claim 18 was rejected under 35 U.S.C. Section 103(a), as allegedly being unpatentable over Small I in view of Meikle as applied to former Claim 11 above, and further in view of Small II. In view of the cancellation of former Claim 18, this rejection is now moot.

The Examiner’s indication that former Claims 7 and 19 would be allowable if rewritten as she suggests is most appreciated. It is believed that new Claim 41 is allowable.

CONCLUSION

Claims 24-41 define novel and non-obvious subject matter of the present invention. Therefore, an early notification that the application is in condition for allowance is earnestly solicited.

Respectfully submitted,



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